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THE WELLINGTON BELT HOLDER.

VARIOUS devices are in use for stopping any single machine without starting or stopping the motive power. The principal among which are loose pulleys and double width driving pulleys. With these the shift is very easily made, but the constant running of the belt, the wear and heating of the loose pulleys, and the constant strain on the line shaft when the machine is not wanted to run has always been a great source of annoyance. Very expensive and cumbersome dead pulleys have also been employed, which are very liable to get out of order, and the difficulty of putting them up after the shaft is in place, causing large cost, prevents their general use.

In the search for something better than these devices, the inventor of the "Wellington Belt Holder" has hit upon one which costs only a small part of the latter, and less than the former, since no loose pulley is needed, and only a single width of driving pulley. The strain is all taken off the shaft when the machine is not running and the belt lies still and slack when not in use. The saving by its use must be very evident. The belt is easily shifted from the driving pulley on the line shaft to the holder, and when set according to the instructions given by the manufacturers, the operator can very easily throw the belt from the holder to the driving pulley, and back again. In fact, holders are in use where wide belts running over loose pulleys are shifted back and forth with ease, while the speed of the line shaft is not diminished. The holder, being on one side of the line shaft, can be put up or taken down at any time without molesting any other part of the machinery, a feature which all millwrights will appreciate. It is used quite commonly in some of the best mills and manufacturing establishments in the country, for shifting large belts that people seldom attempt to shift with loose pulleys. They are now in use beside driving pulleys, all the way from twelve inches diameter, 2½ inch face, up to ninety-four inches diameter, fourteen inch face. One of these holders in the Niles tool works, Hamilton, Ohio, is used to change the motive power of the establishment from water to steam, and *vice versa*.

The Wellington belt holder is a series of rollers turning on iron axle bolts, which bolts are supported at both ends in a strong frame, riveted down over outside iron washers, and arranged in a curved line so that most of them, say from A to X, fig. 2, shall be level with the face of the driving pulley on the line shaft, beside which it is placed, so that the belt can be easily thrown from the driving pulley on to the holder, or from it back to the pulley, at will, by the hand or with a stick, or any convenient shifting contrivance.

The roller, at A, is placed opposite that point on the pulley where the belt first touches it when running upon it. The holder is supported parallel with and close to the driving pulley by the braces or hangers, and does not touch the pulley nor the shaft. It is firmly bolted to the braces, the bolts passing through both sides of the holder and the stays, S S, fig. 1, through which plenty of holes are bored before shipping to receive the bolts.

The roller, Z, is placed inside the pulley circle, so that when the belt is on the holder it is strained less than when on the pulley. It can be used in any position in which belts are used, care being taken to place it beside the pulley, so that the roller, A, shall be at a point on the pulley where the belt first touches it, and the rollers from A to X, level with the face of the pulley. The manufacturers, W. R. Santley & Co., Wellington, Ohio, will be pleased to furnish further particulars upon application.

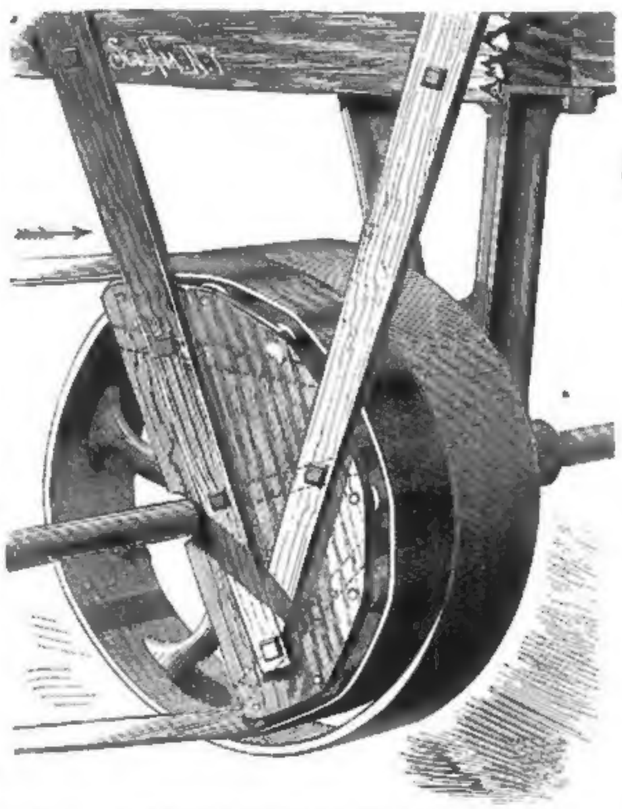

FIG. 1. SHOWING HOLDER IN POSITION BESIDE WORKING PULLEY ON LINE SHAFT.

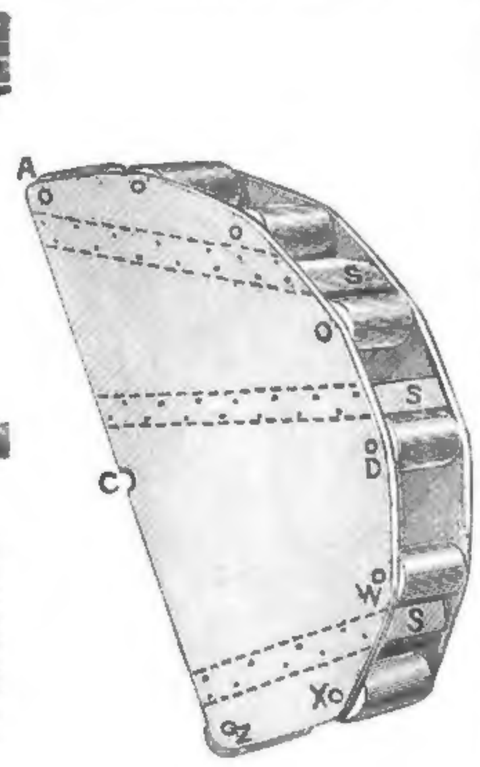

FIG. 2. SHOWING HOLDER DETACHED FROM SHAFT.

THE WELLINGTON BELT HOLDER.

ANCIENT MILLS IN ASIA.

The following interesting article is contributed by Prof. J. Gilman to the *American Antiquarian*, which we reprint as relating what is perhaps the earliest attempt to reduce grains by rolling: "Ruins in Mongolia would be a more correct expression than Mongolian ruins, for these people have hardly anything that could go to a ruin. A tribe of Mongols who inhabited any district, on abandoning their location would leave few traces of their company. Immediately after their going, there would be scraps of felt, rags of skin clothes, odds and ends of tent wood, mouldering fuel, circles of cattle pens at first barren, then luxuriant, a few heaps of ashes and a well.

Twenty years later there might be a remnant of ashes and a slight depression where the well had been, and a few years to that again and it is questionable if even the filled up well would be discernable. The only impression that a Mongol ever makes on the landscape, the only impression that has anything lasting about it, is the horse enclosure, a circular earthen wall which is sometimes thrown up to confine horses at night.

Whence then come the ruins to Mongolia? The people themselves know nothing about them. There seems to be a sort of general tradition that once upon a time the Chinese occupied that country, but who were at last driven out by a victorious Mongol leader who swept the land clear of the detested Chinaman. At the present day this same dispised Chinaman is slowly working his way up north, gradually displacing the tents and flocks and herds of the Mongols, by fields of grain waving around numerous and comfortable homesteads. The Mongol, as he shifts back farther into the desert, heaves a sigh for his departed glory and nourishes in his heart a prophecy said to exist, that in the future there shall arise another great Mongol leader who will again sweep the land clear of the intruder with the battle cry of Mongolia for the Mongols. The ruins found are principally two kinds, cities and mills.

The cities are numerous and found almost everywhere within eighty or a hundred miles of the present Chinese frontier. All that is left of them, are the mud walls fallen and crumbled into mounds, grass grown and seemingly nearly as durable as the natural features of the country themselves. If it is true that earthmounds are the most durable monuments that human industy can raise, some of these cities may be of a very ancient date indeed. In some of these cities we find a few bricks, a few pieces of tile, a block or two of marble, and sometimes, near the entrance of such cities, a perpendicular stone, which probably stands as it had been placed by the same hands that raised the walls which are now represented by crumbled mounds.

It is probable that Chinese literature gives an account of the population who built and inhabited those cities, but in the localities where the buildings stood, and among the present inhabitants of the place, who tend their flocks there and ride up in the evening on these mounds to see if their cattle are coming home, no tradition even of the people seems to be left. "Their memory and their name is gone." The ruins of the cities are not at all strange. They are just what might be expected, perhaps what would be found some hundred of years hence in a Chinese district if the inhabitants were driven out, and their country made into a sheep walk to-morrow.

But the mills are curious. They are found in various degrees of preservation; of some only traces are found, others have nearly half of their structure left, some are perfect and entire. They all consists of two parts; a circular groove and a great round stone with a hole in the center. It is quite evident that the circular stone ran on its edge in the groove. The stone is about six feet in diameter and a foot, more or less, thick; while the groove describes a circle of about twenty-six feet in diameter. The groove is very shallow, being only about seven or eight inches deep. Such mills are numerous in Mongolia. The groove stones may be found put to a variety of uses by the present inhabitants. Are stepping stones wanted for crossing a stream, these old groove stones are hunted up and brought into use; is a big stone wanted for almost any purpose, an old groove stone is most likely to be the first one that offers; does it happen to be necessary to make a run for the water from the well to the watering through, old groove stones are placed with the curve reversed in alternate stones, the joints made watertight with a packing of old felt, and there is a conduct, winding a little, it is true, but more durable than the wooden trough itself, and in not a few cases poorer Mongols do without a trough at all, and water their cattle from a run of these grooved stones.

It is only in the less inhabited districts where no one wanted to use the stones that these rude mills can be seen entire. The question arises what were they meant to grind? For grinding grain the stone wheel seems superfluously heavy and the immense diameter of the groove inconveniently large. What else could it be that these unknown people wanted so badly to grind that they had to set up such cumbersome mills everywhere? What was it that they wanted to grind, and what persuaded them to give their mills so large a circumference as eighty feet? Would not a smaller circumference have done equally well? Are there similar mills found at present, or were these used only by a semi-barbarous or half instructed people who did not know enough to make more convenient mills.

These old mills call up sad thoughts in the breast of the traveler in his lonely journey over the plain. They point to the fact that the land that is now desolate, destitute in many parts of cattle even, was once well peopled. Some ruthless force must have violently set back the hand of progress. It is impossible to sympathize with the Mongols who rejoice in their land reclaimed from the possession of the invader, and as the traveler sees the silent string of camels winding along a road in which with shuffling feet they tread on the now worn level foundation of the walls of houses, it is impossible not to think how much more attractive the landscape would look if thickly inhabited, even by a people who knew no better than to set up mills twenty-odd feet in diameter.

PRODUCTION OF WHEAT AND CORN IN THE UNITED STATES.

The report of the United States Agricultural Departments contains an immense amount of valuable material with regard to the production, consumption, and abundance of our cereal crops, from which we copy the following points as of interest to our readers:

The period from the year 1877 to 1881, inclusive, was one of the great extension of area, in consequence of reduced production in western Europe, and it was also one of continuous and unusual fruitfulness, except in the year 1881, for all of these crops. The occurrence of a series of productive years in America, simultaneous with a certain period of failure in

pression in Europe, has emphasized the prominence and progress of our cereal industries, and called the attention of the world to the rapidity of cereal extension here during recent years.

CORN.

The average rate of yield of corn for the country at large is found to be twenty-six bushels. Since 1870 the average has been less only in 1873–74, and during the three past seasons. It may be deemed a universal crop, though it is practically excluded from elevations above 5,000 feet. Some varieties, however, may with care and under favorable conditions be grown at still higher elevations, but not very profitably. So prominent is this national crop that it has formerly covered five-eighths of the area devoted to cereals, and the product of two states exceeds the entire production of Europe. For the past five years the area occupied by it has been 52.2 per cent. of the aggregate acreage in cereals.

The following statement gives the record of these five years.

	Total production.	Total area of crop.	Av. yield per acre.
1777	1,342,558,000	50,369,113	20.6
1878	1,388,218,750	51,586 750	26.9
1879	1,155,591,676	62,368,504	28.1
1880	1,717,434,543	62,317,842	27.6
1881	1,194,916,000	64,262,025	18.6
Totals	7,897,718,969	290,902,1.4	....
Annual average	1,479,543,794	58,180,497	25.4

The progress of thirty years is shown by comparing the above with the following census record:

	Corn, bush.
1849	598,071,104
1859	838,792,742
1869	700,944,549

The area was larger in 1869 than in 1859, but the yield of the former year was much below the average, reported by this department as 23.5 bushels per acre.

The consumption and exportation of these five years are compared as follows:

	Consumption—Bushels.	Consumption—Per cent.	Exportation—Bushels.	Exportation—Per cent.
1877	1,255,369,890	93.5	87,192,110	6.5
1878	1,300,333,850	93.7	87,884,892	6.3
1879	1,655,019,347	94.3	99,572,330	5.7
1880	1;623,786,396	94.5	93,648,147	5.5
1881	1,150,575,317	96.6	44,340,683	3.7

The average production of five years (the central crop of which being that of the census year) was, therefore, 1,479,543,794 bushels; the average consumption, 1,397,016,162, or 94.4 per cent.; and the average exportation (of corn and cornmeal in equivalent bushels) was 82,527,932 bushels, or 5.6 per cent. Until within a very short period, 3 per cent. was a maximum proportion of corn exports. Less than a third of one per cent. of the crop reported by the ninth census was exported.

The fact illustrates the utter fallacy of the often repeated statement that the foreign demand fixes the home prices inevitably of all our domestic products. The exports (exclusive of meal) in the year named, amounted to 1,392,115 bushels, valued at $1,287,575, or 92.5c. per bushel. Of the crop reported by the tenth census, the exports were 98,169,877 bushels, valued at $53,298,247, or 54.3 per bushel. Here is exportation seventy times as much in one year as in another, but it did not increase the price; on the contrary, it was little more than half the former rate. It was the low home price, however, that made the export possible in one case, and in the other the extreme prices prevented nearly all exportation. Maize is used in Europe in substitution for various feeding materials, or as a supplementary constituent of the animal ration—more largely when cheap, or dispensed with when dear. Two or three, or six per cent. exported will add little to the domestic prices, but a reduction of twenty or thirty per cent. of the crop in a bad year, ds prices up instanter. It is the entire foreign and domestic, that controls fancied magical influence of the foreign element of it, is a myth of a misty era in political economy.

WHEAT.

The yield of wheat per acre for a series of years will average twelve bushels. It is greatest in the northern belt of the winter-wheat area in western New York and the Ohio valley, where in favorable seasons the general average rises to 16 and 18 bushels. The Pacific coast makes an average nearly as good; the spring-wheat rate is below the general average, and that of the cotton states little more than half the general average. Texas, however, is an exception, and is capable of giving higher yields, and Tennessee makes a better average than the southern Atlantic states. The tendency is to lower yields in the spring-wheat regions, and to greater productiveness in that portion of the winter-wheat region where scientific agriculture is making advances. The increase of area has been rapid. Twenty years ago France held the first rank in wheat production of the world. Now, and every succeeding year since 1874—*i. e.*, for nine consecutive years—the United States has produced the largest crop of any country in the world, and has averaged 44 per cent. more than France during that period.

The following statement shows the estimated product, area, and value of wheat for a period of five years, from 1877 to 1881, inclusive,

	Total production.	Total area of crop.	Av. yield per acre.
1877	366,194,148	36,277,546	13.9
1878	420,122,400	32,106.560	13.1
1879	458,488,137	35,430,383	13.0
1880	498,549,866	37,986,717	13.1
1881	383,280,090	37,709,020	10.1
Totals	2,125,629,641	169,512,716	....
Annual average	425,125,928	33,902,435	12.5

The area of wheat has doubled in sixteen years. As with corn, its most rapid increase has been in the latter part of the period. The rapidity of increase, so much beyond the advance in population, is shown by the following decennial figures:

	Quantity, bushels.	P. capita, bushels.
1849	100,485,944	4.33
1859	173,104,924	5 80
1869	287,745,696	7.26
1879	459,488,137	9.20

The advance in wheat production has been, perhaps, the most striking in the agricultural progress in the United States. The increase of population by immigration, in addition to the natural increase of a young and prosperous country, has been unprecedented in the history of nations, and yet the supply of wheat in proportion to population has doubled in thirty years, and 33 per cent. of the entire product has been exported during the past five years. Fifty years ago more than half the exports of agriculture were of cotton, now about one-third, though the quantity is largely increased. Then the exports of breadstuffs were but 16.8 per cent. of the exports of agriculture, and of annual products 9.1 per cent. Now, and for twenty years past, the value of bread and meat products exported exceeded the value of cotton shipped abroad in the same time. It is an extraordinary result that could not have been deemed possible a quarter of a century ago. It is due to the progress of agriculture, the increase of immigration, the extension of railway facilities, and, in a still greater degree, to the skill in invention and enterprise in manufacture of agricultural implements. More than $4,000,000,000 have been received since 1865 from foreign countries for breadstuffs and animals and their products, a few hundred millions more than for cotton exported in the same period.

While it is gratifying to national pride to make this exhibit of surplus production, it is the settled conviction of enlightened and progressive farmers that the stimulation of excessive exportation of corn and wheat, or other raw products of agriculture, is unwise and injurious, depleting the soil, preventing the practice of rotation and delaying a symmetrical development of rural industry. It is an entering into competition with the ryots of India, the fellahs of Egypt, and the serf-labor of the world, simply to underbid them all in a market 5,000 miles from the fields of production. While Dakota is straining every nerve, in co-operation with the British policy of wheat extension in India, to make the Liverpool price of wheat the lowest of any market in the world, Russia and Australasia are pouring in their wheat supplies and adding their contribution toward sustaining in Great Britain the cause of low wages and industrial supremacy.

The wheat and corn crops of 1883 were below the average in yield, and both were interior in quality, wheat being light in weight and corn injured by frost in the northern belt. Three consecutive years of mediocre production have caused comparative scarcity of corn, increased the price, and limited exportation.

The production and area of corn, wheat and rye in 1883 were as follows:

	Bushels.	Acres.	Bushels per acres.
Corn	1,551,066,895	68,301,889	22.7
Wheat	420,154,500	36,398,319	11.5
Rye	28,317,817	2,225,000	12.7

An erroneous impression has been derived from the fact that the European crops of last year, as estimated, were less by 78,000,000 bushels than the average production. But the product of 1882 was 126,000,000 above the average, giving an excess of 48,000,000 above the rate of consumption of the prior period of eight years. The statement is as follows:

	Bushels.
Annual average 1874–81	1,143,826,941
Annual average 1882	1,270,187,150
Annual average 1883	1,066,088,688

To the excess of 48,000,000 bushels surplus in the United States in 1882 add increased production in India and it will not be difficult to understand how the markets of the world have been glutted during the past year. To gather in the surplus of 1882 and carry it half around the world, and place it on the market, run it through the mills and various channels of trade that lead to consumption, requires time, and gives to 1883 a plethora of wheat in a year of low production.

The winter grain sown last fall for the crop of 1884, is generally in good condition. A degree of winter protection from a covering of snow has been favorable to the continued vitality of the plant. In some portions of the wheat area where the surface has been bare, the fields are somewhat brown and sere. On the whole, the prospect up to the present time has been quite favorable.

FORESTS AND FLOODS.

The Adirondack Forests bill seems to weigh heavily upon the minds of the lumbermen of that region. If we are to judge by a speech recently made by Mr. Curtiss in the Assembly, we must look upon the lumbermen as the benefactors of the country, who simply take what would otherwise be wasted in the course of time. We are told that the lumbermen select only the large trees and that the small and young trees remain, and a new growth is ready for the axe in a period varying between 25 and 40 years. If such was the fact, if an intelligent selection of trees was made by intelligent men with a view of protecting the younger trees, nobody could desire more; but so far lumbering interests have always had a tendency to cut trees and accumulate wealth as rapidly as possible, entirely indifferent to the future interests of the country. We would be glad to have the exponents of the Adirondack lumbering interest teach us the contrary.

The old and everlasting harp of "floods occurred in times gone by as well as to-day" is strongly sounded. Well nobody denies that; we are perfectly willing to admit that the rainfall has its cycles, forests or no forests. But nobody can deny that the frequency of floods has increased with the deforesting of valleys and mountains. Forests are the regulators of the water supply, as has been repeatedly urged in THE MILLING WORLD, and as such act as preventers of floods, which can nevertheless, under exceptional conditions, occur at any time.

Meteorological stations are found almost everywhere at present; the stage of water in our large rivers has been observed for years. Why don't those whose interests are at stake, on both sides, select a committee of leading scientific men to collect all the data which in any way can have a bearing upon the subject, and thus settle the vexed question. Such work was, a few years ago, finished in Austria for the Danube, why not do the same here. Of course time and money is needed for such an undertaking, but it would eventually open the eyes of the people to demonstrated facts, no matter on which side of the question under dispute. Then we would arrive at a definite understanding of the influence of woodlands upon the fertility of the soil, the stage of the water in rivers, general health of the country, purity and humidity of the atmosphere, and many other things to be noted in this connection. At present many of these data are well known and understood, but not all, and in such light, the careful and reliable collection of all data, would be a blessing to the country at large.

ABOUT WIRE CLOTH.

From *Oesterr.-Ungar.-Mueller.*

The classification of wire cloth differs in different countries, but as a rule the small numbers denote the large, and the higher numbers the smaller sizes of the meshes. In Germany the number on the cloth gives the number of threads found to the space of one Purssian inch; in Austria, to one Vienna inch; in France and Switzerland, to one Paris inch; in England and the United States, to one English inch. Consequently the numbers of the wire cloth bear the same proportion to each other as that of the length of the various inches; and is best illustrated by their reduction to the metric system.

One inch	English	measure	equals	25.40 mm.
"	Prussian	"	"	26.15 "
"	Vienna	"	"	26.34 "
"	Paris	"	"	27.07 "

The difference between the Prussian and Vienna measure is so small, that they can be accepted as the same for all practical purposes, and this generally forms the type for the classification of most of the wire cloth in use. Whether round wire is used or square wire, the numbers are the same. The shape is only of importance in the final application; for assorting and sifting of the grain, the round wire is preferred, but for cleaning purposes where friction is required, square wires have been found to do better service; their time of service, however, is short, as the sides of the wire, subjected to the constant friction, soon lose their sharp edge and become round.

VARIOUS METHODS OF PRESERVING BREADSTUFFS IN MILLS.

IV.

SHEET-IRON SILOS.

M. Leronx, of Bonny-Sur-Loire, proposed in 1845 a means of preserving grain. To that end, he submitted them to the influence of carbonic acid and shut them up in tinned sheet-iron reservoirs, with 2 to 3 degrees of atmospheric pressure of carbonic acid. We have not sufficient data about this method, to judge of its efficacy.

The corporation of London and some private parties have their granaries in the locality called Bridge-house, at Southwark, and these are built upon two sides of an oblong place. The windows, furnished with trelisses, look towards the northeast in one row, and to the north on the other. All the

windows are about a metre in height, and have no shutters. Each granary has three or four floors, but the ground floor is only used as a store room. In some places they put into the interior of the granaries a network of brass wire, about one metre in height, with close mesh, so that vermin, such as rats and mice, cannot pass through. Some put upright planks, upon which they place others parallel to the horizon, and forming an acute angle with the first, with the same view to banish those animals; for independently of the grain which they devour, their excrement and urine dampen it, and causes the grain to spoil. In the building of those granaries, the idea is to make them solid, and expose them to the wind which is most drying.

In Kent, in England, the wheat is first well cleaned, and all foreign substances separated from it. After being threshed it is thrown with the shovel from one side to the other for some time, so that all the rubbish will remain between the two piles of wheat, and that which falls in the center is sifted in order to separate the good grain from it, in case any should fall there. It is then taken to the granaries, spread about six inches thick, and turned twice a week. At the end of two months it is laid about twelve inches thick, turned about once a week, and sifted more or less according to the dampness or dryness of the season. At the end of five or six months it is put in layers of about two feet, and is turned every fifteen days, and sifted once a month. At the end of a year the layer of wheat is made three feet and three or four inches in thickness; it is now turned every month and sifted proportionately in the same time. After the grain has remained two or more years it is turned once in two months, and sifted every three or four months, and so on according to the brilliancy, hardness, and dryness of the grain. An empty space of about one metre is left on all sides of the Chamber, and another of two metres in the centre of the whole length, so as to have room to turn the wheat as often as is needed. Sometimes wheats have been kept in the London granaries for thirty years and over. The older it is, the more farina it gives in proportion to its quantity, and the bread made from it is very white and delicate. The grain loses nothing in effect but its superfluous humidity.

It is claimed that a great deal of American sour flour reaches the other side of the Atlantic. It is in fact, one of the items in the price list of the Liverpool papers. This flour must have been damaged by water on the voyage, or else it became heated from an excess of moisture. There is, however, a good deal of the flour damaged on our lakes and canals, and with care, much of this could be avoided, or entirely prevented, but where flour heats from its own moisture, the carrier is not to blame as the same thing is liable to happen in stores. A great many advocate drying the grain or flour before packing it. Attention was directed to this subject in France in 1858, which was a very wet year, and much of the stored flour became heated, and was attacked with mildew, in consequence of which it lost much of its nutritive value, and yielded less bread according to the government standards. To obviate this evil, the drying machines were introduced and found to work successfully. They were in the form of a long vertical cylinder, in the interior of which a spiral plate extended from top to bottom, and revolved on a spindle. This plate was heated by steam pipes, and the flour to be dried was received in a spout at the top, and carried down on the warm spiral plate. The moisture was carried off by a funnel, and the flour discharged at the bottom in a dry room. The flour was then cooled before being packed into water proof bags; particularly if intended for a sea voyage, a long journey, or a long-continued storage. Vegetables and most organic bodies will remain unchanged for a long time in a dry atmosphere, while they decay rapidly if exposed to moisture. Flour which is intended for immediate use, does not require to be dried. The climate of Minnesota, Dakota, and Kansas is much drier than that of Great Britain and Ireland, or, in fact, any portion of western Europe, so that our flour generally contains less moisture and is not so liable to heat as theirs, but allowing for this, it has too much moisture for a lengthened storage or a long sea voyage.

Chemical analysis shows that wheat, buckwheat and Indian corn, and also the flour and meal manufactured from them, when under the influence of water, air and heat, are either partially or entirely changed, so that the ultimate principles of each of the grains named, oxygen, hydrogen, carbon, and nitrogen, combine in new proportions, and of course form new compounds. To this process of decomposition the general name of fermentation has been gixen. It differs according to the substance acted upon and the circumstances in which the article is placed. There were formerly only five varieties of these processes known: the saccharine, in which starch is changed into sugar; the sugar, in which sugar is converted into alcohol; the ascetous, in which alcohol and others substances are converted into vinegar; and the putrid fermentation, or putrefaction, which charcterizes the decomposition of nitrogenous substances, as wheat, rye, corn, buckwheat, and vegetable azotized substances.

Recent chemical experiments, however, combined with a more ultimate vegetable analysis, show that our former knowledge of the process of fermentation was very limited, and that several of its phenomena and the change which it effects among the various substances are no less striking than important in the several applications to the art of living, and, indeed, this latter is from day to day more and more based upon scientific principals. Fermentations are now arranged into twelve classes, as follows: The alcoholic, the saccharine, the viscous or mucous, the lactic, the acetic, the gallic, the pectic, the benzolic, the sinapic, the ammoniacal, the putrid and the fatty. The process of fermentation requires a temperature of from 40 to 100 deg. Fahr. together with the presence of water and the contact of air containing germs of vegetable organisms. In order to have sound grain and flour there must be something done to put an end to this fermentation in stores and granaries, and this can only be accomplished by drying.

The process of fermentation commences at any point from 45 to 95 degrees Fahr. With our extended seaboard and inland seas, by the great lakes and rivers, there is a trade carried on between state and state which far exceeds the foreign exports of the United States, and where our breadstuffs are required with an increasing market, and in order to prepare the grain or flour, so as to withstand the effects of moisture in transit or store, it should be thoroughly kiln dried, or dried by some other means without the direct action of fire. Grain is different from most other articles of merchandise. Wine is an increasing commodity. Breadstuffs are a constantly decreasing quantity. When wheat, and other grains are deposited in a granary, besides being fluctuating in value, vermin prey on it and germination and decomposition help to add to its ruin. If man would imitate the most thrifty of all insects, the bee, which hermetically seals up its food in the honey cells, it would be a further step towards an advance in civilization. We see meat, fish, and even vegetables stored up in cans and rendered durable for years, and yet grain is often left to germinate and rot without resorting to any artificial process of preservation.

SITUATIONS WANTED.

Advertisements under this head, 25 cents each insertion for 25 words, and 1½ cents for each additional word. Cash with order. Three consecutive insertions will be given for the price of two.

SITUATION WANTED.

By a miller and good stone man, worked custom and merchant mills both East and West. Good references. Address D. HALLORAN, 406 E. 15th street, New York, for J. BARRETT. 24

SPECIAL ADVERTISEMENTS.

Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1½ cents per word for one insertion, or 4 cents per word for four insertions. No order taken for less than 50 cents for one insertion, or $1 for four insertions. Cash must accompany the order. When replies are ordered sent care of this office, 10 cents must be added to pay postage.

FOR SALE OR RENT.

A tide water grist and merchant mill in good order. Only a small capital required to run it. Terms easy and possession given immediately. A Bargain. Three run of burrs. Thirty miles from New York City. The mill remodeled three years ago. Address, CHARLES E. STUDWELL, Greenwich, Conn. 2326

FOR SALE, "THE ALEXANDRIA MILLS," ALEXANDRIA, OHIO.

A New Process custom and merchant mill. Steam and water power, with saw mill attached. A railroad town of 500 inhabitants. In a good wheat growing locality. Will sell very cheap. Address, Box 140 Alexandria, Ohio. 2326

FOR SALE CHEAP TO CLOSE AN ESTATE.

Valuable mill property on P. & W. R. R., three miles from Pittsburg city limits. Brick building 40x60, 3½ stories high, 3-run of stone with purifier and ample bolting and cleaning capacity for same. Also rye and cornmeal bolts. Good water power, 9-foot head. Address N. SHAW, Glenshaw, Pa. 26tf

MILL PROPERTY FOR SALE.

The subscriber offers for sale his grist mill situated in Tioga Centre, Tioga county, N. Y. Said mill contains three run of stone, and one 12 foot overshot wheel, also one dwelling house, barn, and six acres of land on which is hundred fruit trees, situated in same village. Within one-half mile of Erie and Southern Central Depot. Call on or address B. B. FRANKLIN, Athens, Bradford county, Pa. 2326

FEED MILL FOR SALE.

A portable iron disk feed mill for sale. Well built, large capacity, and in perfect order; unpacked, as delivered from factory. Price, $40. Address, O. F. F., drawer 203, Buffalo, N. Y.

FOR SALE.

Dearborn custom flour mills, 2-run stone, water power, 6-foot head. Located 12 miles from Detroit, and 2½ miles from Michigan Central R. R. Mill rebuilt past two years. Building 32x44. Nearest mill 8 miles. Address H. MOSELEY, Box 45, Dearborn Mich. 252

WILL BUY OR LEASE.

The latter preferred A mill in northern Indiana, southern Michigan, or southern Illinois. From 75 to 150 barrels capacity. Must be on railroad. State capacity, whether stone or roller mill, and very best terms, giving all particulars concerning property. Address "BUSINESS," care THE MILLING WORLD, Buffalo, N. Y. 25

FOR SALE CHEAP.

One 6-horse power engine and 10-horse power boiler, all complete, price, $350; one 8-horse power engine and 10-horse power boiler, price, $375; one 10-horse power Portable complete, price, $350; one 10-horse power Russell Traction, price, $500; one 4-horse power vertical engine, price, $120. Call or address for particulars, EZRA F. LANDIS, Lancaster, Pa. 252

FOR SALE.

Second-hand No. 3 purifier as good as new. Price $75.00. Second-hand 12-inch burr, iron frame middlings mill, $40.00. Second-hand 18-inch middlings mill as good as new. Old French burrs, as good a mill as there is on the market, $85.00. One 21-inch 2nd Eureka water wheel of the latest sytle as good as new, $125.00. Address A. N. WOLF, Allentown, Pa. tf

NOTICE TO MILLERS, ETC.

Blue Springs, Nebraska, has the best water power of any town in the state. Those who contemplate building a flouring mill, factory, or other establishment run by water power will find it to their advantage to correspond with Sec. Board of Trade, Blue Springs, Nebraska. 265

FOR SALE.

Water Mill in Kansas. About 100 bbls. capacity. Ten feet head of water. Good stone flume and desirable merchant trade established. Averages 130 bushels daily in exchange. Located at a railroad town and county seat, in the best winter wheat belt. Will be sold at an early day to the right man. Mill now running day and night. Good reasons for selling. Address, with stamp enclosed for particulars, Lock Box 48, Vandalia, Ill. 6tf

RARE CHANCE.

For four thousand dollars can be acquired, with immediate possession, the Humboldt County Mill, situated at Livermore, Humboldt county, Iowa, and erected in 1883. Three-run burrs and one pony-run; large bolting capacity; boiler and engine good and ample in power; on side track of B., C. R. & N. R. R., and within 250 yards of the Minneapolis & St. Louis depot. In the best wheat section in Iowa. Terms reasonable. Apply to CHARLES HUTCHINSON, Oskaloosa, Ia. 252

GRIST MILL FOR SALE.

The undersigned having engaged in business in Louisiana has decided to offer his grist mill in the village of Brocton, for sale to the highest bidder, on the first day of May, 1884, at the mill in said village, at 2 o'clock p. m. The mill is two stories high with basement, is propelled by a new Burnham turbine water wheel, has three run of burr stones, new corn sheller, building and other machinery in first-class condition. THOMAS CAPWELL, Brocton, N. Y. T. S. MOSS, Agent. 241

FOR SALE AT A SACRIFICE.

A merchant and custom mill, water power, 45x70, two stories and basement, five run of burr; ready sale for all the buckwheat which can be manufactured, which has an unrivalled reputation; Cranson's roller buckwheat shucker, new last fall; kiln for drying grain; two dwellings; barn 40x60, three stories, eight stalls; ice house, new, 40 tons capacity; carriage house, etc.; 18 acres of land; situated three miles from railroad, one and a half from boat; railroad to be built this year passing premises. Satisfactory reasons for selling. Price, $7,000. Address, E. N. SIPPERLEY, Westport, Conn. 241

SOME BARGAINS.

We have on hand the following machinery, which we have replaced at Hardesty Bros. mill, at Canal Dover, which we will sell very cheap:

Two No. 3 Hunter Purifiers, in good order.

One No. 6 Smith Purifier, good as new.

Two No. 8 Silver Creek Bran Dusters.

Two Double Set of 9x18 Stout, Mills & Temple Rolls one set corrugated, 20 cuts; other set 24 corrugations. Rolls were replaced by larger ones.

Four Gratiot Wheat Heaters, good as new.

Also a lot of Bolting Cloth, Pulleys, shafting, and other articles too numerous to mention. Address, THE MILLER CO., Canton, Ohio.

MILL PROPERTY FOR SALE.

Either a half or whole interest in the Rossville mill, situated at Rossville, Shawnee county, Kan., on the U. P. railway. This lively and business town contains all kinds of stores and shops, four churches, graded school, newspaper, land office, &c. It is 18 miles from Topeka, the Capital, and in the widest part of the Kansas river bottom where Millcross and Soldier creeks empty. This station ships more grain than any other station between Denver and Kansas City. The property is a comparatively new 50x80 feet three story stone building with a capacity of 75 barrels per day. Sixty-five horse power engine, almost new, improved machinery in the mill and in splendid condition. In addition there is a flour house holding six car-loads; coal house holding ten car-loads; elevator and corn dump and steam sheller of 5,000 bushels hulling and storage capacity per day. There is a side track by which all grain, flour, coal, etc., is handled directly in and out of cars. The mill has a storage capacity for 12,000 bushels wheat, grain in every bin can be handled by elevator. Adjoining to mill there is corn cribs and granaries. Also a two room office with Fairbanks grain scales. Good hog yards, good shelter and excellent access to water. Terms of sale reasonable and will be made known by addressing E. S. McCLINTOCK, Rossville, Kan. 262

The MILLING WORLD
and CHRONICLE of the GRAIN & FLOUR TRADE.

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ADVERTISING.

Card of Rates sent promptly on application. Orders for new advertisements should reach this office on Tuesday morning, to insure insertion in the week's issue. Changes for current advertisements should be sent so as to reach this office Saturdays.

EDITOR'S ANNOUNCEMENT.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with any manufacturing or mill furnishing business. Its editorial opinions cannot and will not be influenced by a bestowal or refusal of patronage. It has nothing for sale, but its space to advertisers and itself to subscribers.

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PROSPECTIVE.

MAY wheat is slow of sale in the City of Chicago, at 84c., as we are writing. A high average for the wheat yield of the United States would be thirteen bushels per acre, which at 84c. per bushel would represent a gross income per acre of $10.92. Now who among our agricultural friends are anxious to raise wheat at such a price? This 84c., however, does not represent the price of a bushel of wheat on the farm, but in the grain elevators of Chicago, in the majority of cases hundreds of miles from the place of its growth, and after the commissions and transportation charges have been paid upon it. In certain sections of this country, and under certain conditions, wheat may be very profitably grown at the above mentioned, or even a very much less, price, but for the entire product of the country it would prove unremunerative, and, in cases, would entail actual loss upon the grower. It is perhaps true that most of last year's crop was marketed by the producer at something more than 84c. per bushel, but we believe it quite safe to assume that it was not. Counting cost of seeding, harvesting, threshing, marketing, and interest and taxes upon the value of the land, and the margin of profit, even were the above price realized, would be, in the majority of cases, very small.

Current prices of wheat plainly evidence that we are not in a position to dictate values upon this cereal to the world. It has been fondly believed that not only England, but other foreign nations, were permanently dependent upon us for supplies, and that necessity would compel them to acquiesce in our ideas of value. A succession of unfavorable seasons and insufficient crops in Europe enabled us to advance values beyond a healthy standard, and went far to strengthen our opinion that America was destined to become "the granary of the world." The thoughtful man could, however, see that this would not be.

As the country advances in population, in wealth and in culture, so ideas of value increase. At the breaking out of the war of the Rebellion, the business interests of the country, then only beginning to recover from the financial troubles of 1857, were paralyzed. This was, however, but temporary, and the North soon entered upon a season of prosperity such as, probably, no other section of the world ever experienced. Its growth in wealth, albeit of a fictitious nature, was marvelous: speculation and "flush times" reigned supreme; no scheme was too wild, no project too chimerical for the people in their mad race for wealth. The war closed, leaving to be provided for, a huge national debt. During the war manufactories of various kinds had come into existence, and because the flush times had given the people money, such as it was, had flourished. The impetus given the country by the war did not expend itself until the fall of 1873, and then stagnation followed almost as quickly as did briskness ten years before. Its effects were far-reaching and disastrous, still the wealth of the country had not decreased. Accustomed as we had then become to high prices, high taxes, and high living, we have not yet succeeded in recognizing at its true, actual value, the almighty dollar. The dollar of to-day is just the same as the dollar of twenty-five years ago, yet its purchasing power is very much less. It takes more of these dollars to make a rich man to-day than it did twenty-five years ago, and why? Does it cost the hen more to lay her eggs? or the sheep to grow its wool? or the cow to produce her milk? or the fields to produce their grass? Not at all. We have simply placed a higher value upon these products because, during the war our paper dollar was worth but one-third its face value in gold, and when we resumed specie payments we forgot, apparently, that this gold dollar should by rights have a much greater purchasing power than we have since accorded it. In 1857 we paid five cents for a cigar. In 1867 this narcotic cost us fifteen cents, and to-day, too many of us think a less price means a much inferior article.

Of course this is all wrong but what is to be done about it? To-day your farm hand demands and obtains twenty to twenty-five dollars per month; your hired girl must have anywhere from two to five dollars per week, and pay it you must or suspend operations. In reality it makes little or no difference to you what value is placed upon the dollar, that is whether its purchasing power is greater or less than it was twenty-five years ago, provided you can get hold of them in the same ratio. Wheat, however, is not one of those articles which is likely to keep pace in value with other agricultural products. It is in universal demand, yet must be cheap in price. It will flourish in so many sections of the globe that the effort of any one locality to regulate its price will soon prove ineffectual.

British millers bought our wheat and paid our prices only so long as they could do no better, but neither they nor anyone else can afford to long continue buying cereals grown upon land so valuable as is ours. We shall, undoubtedly, for many years to come, export wheat, but the tendency plainly is to encourage its culture in other countries where land and labor is cheaper than with us. This does not signify a decadence of our agricultural interests, but rather a change in the direction of endeavor. Wheat culture has passed from the East to the West only because that cereal could be produced in the latter locality cheaper than in the former. So in the future it will be abandoned as an unprofitable crop in many localities where it now forms the staple product. Gradually but surely will this be brought about, and with it will come as great a change in the character of the business carried on by our millers. We are not of those who believe this country will ever import wheat for consumption, as no matter how costly it may be in price, a profit will accrue to the miller from its conversion into flour for his home markets. On the other hand we do look for a material curtailment in our flour export in possibly a not very far distant future. We are to-day finding market in foreign lands for our surplus product. When wheat from other countries can be laid down in Liverpool for less money than can ours, and be of as good quality, then will our flour export begin to grow smaller, and the indications are that such a time is rapidly approaching.

CAN WHEAT BE TOO CHEAP?

A valued correspondent, and former liberal contributor to our columns, writes:

Prior to 1859, Mr. Mulhall, the British Economist, states, that the United States at intervals imported wheat from Europe. At present it produces fully one-fourth of the crop of the entire world. Prior to 1855, California was entirely dependent on Chili for its breadstuffs. At present the wheat exports of California are counted by thousands of tons yearly, far in excess of that of Chili. As late as 1865, Australia too, was dependent upon Chili for her flour, while now some of the Australian colonies export yearly as much as 20 bushels of wheat to the inhabitant. Facilities for transportation have so improved that wheat grown in New Zealand and far west of the Mississippi river in the United States is laid down as cheap in Europe as that raised on the Don or Danube. Is there not danger that too much wheat will be grown, or does the philosophy and political economy of THE MILLING WORLD deprecate the blessing of cheapness, rather than of dearness or of abundance rather than of scarcity? Where everything is cheap alike, wheat cannot be too cheap or abundant at any price. But with a tax of 40 per cent on iron, 20 per cent. on lumber, 100 per cent. on window glass, and 40 per cent. on clothing, &c., &c., as now prevails, American wheat growers and millers have a fearful load to carry, compared with the rest of the civilized world.

It is not the province of this paper to discuss political questions. It may be admitted, and we think will be, very generally, that the prosperity of this country during the past twenty years has been due, perhaps entirely, to the protective tariff. In childhood we surround our progeny with every protection possible, and no doubt would continue to protect them so long as we lived, would our children have it so, but, as their strength increases, they become chary of accepting this protection and finally will have none of it.

The protective tariff has worked very beneficially for the majority of our manufacturing establishmenls, it has made them prosperous, and has vastly increased their number, until now their productive capacity has largely outgrown the home consumptive ability. It has become necessary for us, in order that these industrial establishments may be kept busy, to seek an outlet for our products, and right here, in many cases, we find our protective tariff an impediment. In some lines of productive industry this is not the case, and as a result we find now two parties, one in favor of a reduction of this tariff, the other, while perhaps not outspokenly in favor of an increase, yet, opposed to any reduction. It is a difficult, perhaps an impossible, thing, to determine which party is in the right, still, as we have been wont to boast of our great natural resources, it would seem that we should now have passed the season of childhood and be in position to cope successfully with other nations for commercial supremacy.

Our correspondent asks "Does the philosophy and political eeonomy of THE MILLING WORLD, deprecate the blessing of cheapness rather than of dearness, or of abundance rather than of scarcity?" Under existing conditions we must frankly say that we do. If the cheapness and abundance existed only in the United States we would regard it as a blessing for this country, but as this is by no means the case, the present condition of our wheat markets and of our milling industry warrant the conclusion that wheat, at least, in this country, may be too cheap for our good.

THAT cold can be produced by artificial means is a well-known fact; that it can be formed at a comparatively low cost is now demonstrated in a large [illegible] York house where a maintenance of a refrigerator for every room does not cost more than two cents a piece every day. There is a wide field of application here. This same artificial cold is now utilized in the storage of meats, eggs, butter, etc. The question is how can it be applied economically to prevent putrefactive or fermentative changes in breadstuffs, which are less perishable, but still under certain conditions subject to destructive changes? That flour and grain "heat" sometimes is too well known to need any special mention, and if cold air can be produced cheap enough, at some future date, to counterbalance the heating tendency, the inventive genius of Americans will soon discover a means to utilize the knowledge in the proper manner. The flour and grain can be kept for long periods without any apprehension and handling of any kind, and if the same principle was applied to our means of transportation, flour leaving the Northwest should arrive in Liverpool in the same condition in which it left the mill. This may be a premature idea, but still who can tell what the next generation will bring in the light of past and prosent advances?

CHICAGO, by universal consent, holds the proud distinction of being "the wickedest city in the country." Whether liberality is a concomitant of sinfulness we do not know, but political and other conventions are secured only by liberality and this year both political parties hold their conventions in that sinful locality. In addition to that there are rumors to the effect that the Millers' National Association contemplates holding its annual meeting there. A republican convention is said to be bad; a democratic convention is popularly supposed to be worse, but a millers' convention when it lets itself loose without regard to party bias, can provide a little the brightest quality of red with which to decorate a town.

IT is darkly hinted that the worthy secretary of the Millers' National Association "has his special favorites among the milling journals to whom he sends private dispatches of all matters of interest, carefully concealing them from all others." Undoubtedly these "special favorites" pay all charges for these "private despatches," and as nothing "of interest" has transpired in several years, we fail to discover where injury has been inflicted.

WHAT has secretary Seamans been doing to merit this from the *Southern Miller*? Referring to the late meeting of the Executive Committee of the Millers' National Association it says: "Bros. Seamans says 'the sky is somewhat cloudy and the meeting laid out considerable work'. We think that if they would lay out a secretary or so it would conduce largely to 'the good of the order.'" This is very hard.

OUR readers have noticed that for two or three weeks THE MILLING WOLRD has had no patent illustrations. The precarious condition of the wheat markets, and the near approach of the presidential nominations, have probably exhausted the fecundity of inventors; at least of those in the milling line.

SPEAKING of the Millers' National Association, when do the members of that august body, appointed, or selected, to pronounce judgment on the Gilbert patent, render their decision?

THE FUTURE OF THE FARMERS OF EUROPE.

From the German by Karl Kautsky, Leipzic.

THE quantity of grain which floods the European markets is increasing from year to year. After the projected Indian and African railroads are built, the amount of breadstuffs at the disposal of Europe, will be simply enormous. Even now, the transmarine import is almost crushing. The grain importing states of Europe require, on an average, 48,000,000 hectoliters of foreign grain, while in 1881 there were 114,700,000 hectoliters to supply the demand, of which the largest half came from the United States. It is but natural that this should depress the prices sufficiently to bring the European farmer one stride nearer ruin.

How can this terrible competition be withstood? By means of grain duties? We cannot expect much help from the grain exporting states as they only want to get rid of their surplus. The Austrian, and above all, the Hungarian farmer would be ruined as soon as the Austro-Hungarian grain or flour export ceases. Besides, France and England do not even think of making the grain duties high enough to protect their domestic producers, since that would ruin other industries. Even in Germany high grain duties can no longer serve the farmer. Protective tariffs may have the effect of permitting the quiet development of a crude industry, but they cannot operate against over-production. No protective tariff ever had power to check a downward prices.

It would be a very high protective tariff, indeed, that would keep transmarine grain from the German market, particularly as the cost of production in Germany as compared with that in America, is very high. For instance, the protective tariff must be high enough to raise the price of rye 30 per cent, in order to make its cultivation profitable to German farmers. But could the industries bear such a weight? If capital is strong enough, or rather, if the laborer is too weak, so that the wages are not raised accordingly, then the laborer will be reduced proportionally in his power to consume if this is possible; if not then he will starve or, in despair, attempt by unlawful means to get his bread. If the wages rise with price of food, the actual earning will, after all, remain the same.

By means of grain tariffs, so mighty a movement as the transmarine competition cannot be banished. There are at present, those, and their number is increasing, who think that nothing can be done but to leave the supplying of Europe with cereals to America; and that the European farmer must do as the Italian farmer did long ago, *i. e.*, pass from agriculture to stock-raising. But only the representatives of large estates talk that way, for transition to feed growing will be the death blow of small farmers.

There, are, however, two ways in which transmarine grain competition can be combatted: it must be made more expensive than it is now, or the cost of production in Europe must be reduced. There is no third way as long as competition lasts. Transmarine provisions can be made more expensive by high duties, but such a proceeding operates only in favor of the government. We must therefore endeavor to produce in Europe, as cheaply as can be done in America. Reduction in the cost of production is the solution of this question, but it cannot be solved by reducing the wages of labor, for that would be like the logic of the man who opened his artery to feed himself with blood.

We must reduce the cost of transportation, and above all, our standing army. But heavier than the national debt, the high farm rent presses the German farmer. The state must enable the farmer to change his present system of small farming to improved methods on a large scale. This can best be accomplished by a modified revival of the old system of parish property. The state would furnish the land stocked and equipped on the most improved plan. The management to be left to a scientifically educated agriculturist. Every parishioner would be obliged to work for a certain number of days on the parish farm. The proceeds would pay parish and state taxes, and the surplus be divided equally among the parishioners. Thus the poorest would be benefitted most, and the rich would suffer no loss. In order that our climate may be improved, our woods must become national property. Of course we do not mean that the government shall have any other control over the woods, as well as our railroads, than to operate them for the public welfare.

The most difficult problem would be the improvement of the soil without great expense. How can the cheapest manure be obtained? The larger towns and cities furnish large quantities, but this redounds to the benefit of their immediate neighborhoods, since transportation increases the cost too much. Measures must therefore be devised by which the products of the soil can be consumed nearer the destination of the manure, in other words, the industries must be transferred to the flat countries.

That these measures, taken together, would check American competition, is evident. The manure, now washed into the rivers and serving no purpose except to make the water impure, would raise the yield of the land to such an extent that American exhaustive farming could be competed with, particularly as this measure would result in permanent benefit, enriching the soil without loss, since the soluble mineral matters are given back. In the meantime, American agriculture will, after a few generations, be ruined by the exhaustion of the soil. Only then, when all that we have demanded; the removal of the industries to the flat country, the nationalization of railroads and forests, the general establishment of parish properties, the reduction of the army budget and of the interests on mortgaged lands, only then will the surplus of America no longer effect the ruin of European agriculture, but in case of short crops, cover the deficit and convert a curse into a blessing.

If lazy routine and narrow-minded private interests should prevent such far-reaching radical measures; if those in power should be content with destroying by means of grain duties the industries which consume the products of agriculture; or if, in order to get cheap bread for the industrial workmen and to get low wages for the industries, they should expose to a gradual decline the best markets of the industries, the agricultural population, then European agriculture will see its end near, Europe will become a stony waste like Sicily and Asia Minor, unable to feed and support its inhabitants.

WHEAT SHOULD BE EATEN AS IT GROWS.

Every physician in this country who is posted on cereal foods knows that wheat, as it grows (except the skin), contains more nutrition than any other food, either cereal, animal, or vegetable. It was intended that we should eat wheat as it grows, as we do an apple or a potato, all but the skin, but there has never, until recently, been known any possible means or way to make all of the wheat fine; hence the millers have given us nothing but "the beautiful white flour," from which the best or most nutritious part of the wheat is eliminated, or the so-called "graham" flour, a name, title, or brand which causes a multitude of sins. Most of the "graham" flour sold in this couutry is nothing but a mixture of the lowest grades of white flour with bran. No physician who is posted on cereal foods, and knows the merits of the entire wheat flour, will advise any one to eat graham flour, while every physician in this country and England, who has seen and knows what it is, uses and recommends the entire wheat flour, which fact is explained by a short statement of the way it is made, viz.: The wheat is first cleaned in the usual way, then it goes to a machine which takes off the skin or husk; then it is reduced, not ground, by the regular roller process (except purifiers); then, after the separation by bolting of the bran from the white flour, the bran is reduced by special machinery; then by a system of spouting, the bran and white flour is brought together and mixed in exactly the same proportion that existed in the berry. The flour is not only much more nutritious than any other, but will assimilate with the weakest stomach, because it is fine and contains all the gluten and phosphates there are in wheat, which can be said of no other flour in the world. It is cheaper than any other because it makes so much more bread, which is explained by the theory of porosity —Dr. Tooker, in *Inter-Ocean*.

THE GRAIN PROBLEM.

Speaking about the grain problem the San Francisco *Chronicle* says: Wheat is always a good speculation when selling below the average cost of production in Europe, and that point was reached some time ago. So far the great bulk of the loss has fallen on European speculators, producers, and shipowners. It has scarcely touched the American, Australian, or even the Indian farmer. And this has ever been the case. When John Bull refuses to pay a fair price for his bread the British shipowner has in a great measure to make up the deficiency. Except in the highly improbable event of a tonnage conspiracy, as in 1880-'82, unless the California farmer obtains a fair paying price for his coming bonanza wheat crop of 1884, which cannot be too large for the welfare of the state, he will insist on paying only a bare living rate for its transportation to Europe. But by that time the wheat crisis will be at an end, English stocks will have fallen to their ordinary level, the bugbear of Indian competition will be better understood, and a new set of speculators will have entered the market. It is to be hoped there will be plenty of room for fair freights as well as for fair prices, and that consumers, producers, and shipowners may be happy together.

IS PRODUCING ASTONISHING RESULTS.

YOUNGSTOWN, O., March 15th, 1884.

GEO. T. SMITH PURIFIER CO., JACKSON, MICH.

Gents: We are running the tails of six purifiers and one middlings reel, also the blow room stock of seven purifiers, to the last Centrifugal you sent us. The reel is doing splendid work, in fact is producing astonishing results. You will send me another one just like it to make a final finish of our low grade stock. When this fifth centrifugal is added to our City Mill, as above indicated, the mills that stand ahead of it in purity of product, and economy of yield, are few and far between.

Respectfully Yours, HOMER BALDWIN.

YOU CAN SECURE LIKE RESULTS. WRITE US FOR PARTICULARS.

THE GEO. T. SMITH MIDDLINGS PURIFIER CO., JACKSON, MICH.

HEAD LININGS
AND
COILED BARREL HOOPS.

Our Celebrated Patent Head Linings are straight Rounded on their upper edge nail on barrel. They will freely through the square are packed. We can furnish from twelve to seventy-two GOOD Head Lining can

Round Edge Bent Barrel grained from end to end, and crimped or bent ready to not mold, as the air circulates bundles of 250 in which they them any desired length, inches, and as cheap as any be sold.

CAN FILL ALL ORDERS AT SIGHT.

REED & SILL COOPERAGE CO.,

DETROIT, MICHIGAN.

PATENT MILLSTONE CEMENT

Invaluable to Millers for Repairties and Seams in French

This is a new article of manufacture, and is common use by millers. It is much cheaper, son. It is perfectly harmless, containing nature and attains the hardness of French only fills the cavity, but adheres to and begrinding. Good Millstones are now in use, composed entirely of

TRADE MARK.

ing and Filling the Joints, Cavi-Burr and other Millstones.

greatly superior to the preparations now in and can be applied by an inexperienced pernothing of a poisonous nature. It has the Burr Stone, wears evenly with it, and not comes a part of the Stone, and assists in this preparation. The

LEADING MAKERS ARE ADOPTING IT TO BUILD THEIR MILLSTONES.

For miller's use, it is put up in cases of about 50 lbs. ***Price per case, $5.00.***

We cannot open an account for so small a sum, therefore ***Cash should be sent with order*** otherwise we shall send C. O D. by Express, collecting for return of the money.

For manufacturers, we furnish in bbls. of 300 lbs. Price upon application.

Emery Rub Stones, for hand use in Finishing the Furrows and Faces of Millstones.

Union Stone Co., 38 & 40 Hawley Street, Boston, Mass.

Union Emery Wheels, Emery Wheel Machinery and Tools a Specialty. Wooden Polishing Wheels, Grinders' and Polishers' Supplies. Catalogue on Application.

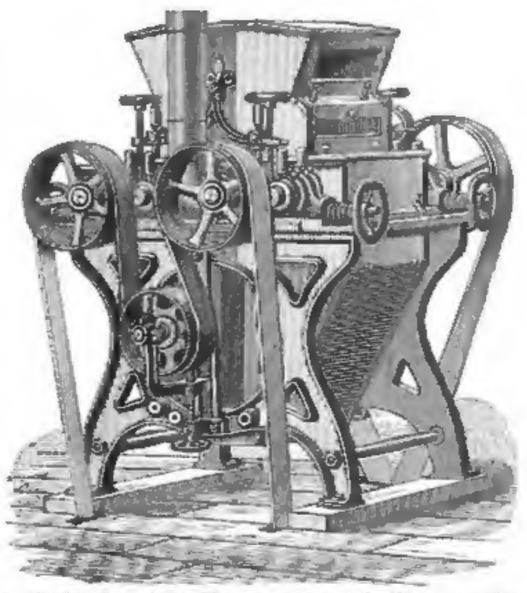
EMERY, QUARTZ, CORUNDUM.

THE ORIGINAL SIX-INCH ROLLER MILL.

THE BEST ROLL IN THE MARKET

RICKERSON'S

PATENT IMPROVED ROLLER MILL.



Our six by twenty rolls weigh 175 pounds each, making 700 pounds to drive in a double set roller mill, as against 1800 pounds in the old style mill; this fact enables us to run with greater speed, with no danger of hot journals, hence our greater capacity. Produces better results, because there is less Pulverizing and Better GRANULATION, the point of contact being much less on a SIX-INCH ROLL than the old system; the STOCK BEING KEPT LARGER and more middlings produced on each reduction. It is a well established fact that the object in gradual reduction milling is to make as large a percentage of middlings as possible, and we claim to make MORE MIDDLINGS from a bushel of wheat THAN ANY OTHER ROLLER MILL, and we are prepared to prove our claim. The MORE MIDDLINGS the greater percentage of PATENT FLOUR, and better COLOR of ALL grades. We build the only Roller Mill with **PATENT EXHAUST ATTACHMENT** for taking away all GENERATED HEAT, thus doing away with the GREATEST ANNOYANCE that millers have experienced in running the gradual reduction system, at the same time keeping the stock cooler as it passes to the Reels and Purifiers, consequently the separations are made more easily. We use nothing but the Ansonia Chilled Iron Roll, with steel journals, ground, and run them entirely with LONG belts. With a feed device for throwing out and in easily, with a leveling device that is positive and perfect, and an adjustment so entirely positive, that feed can be stopped or cut-off, and put on again without readjusting rollers. **WE DO NOT DEPEND UPON THE STOCK TO KEEP OUR ROLLS APART.** We are prepared to furnish plans for our Gradual Reduction system on short notice, and fill orders for our Mills promptly. **We make both Corrugated and Smooth Rolls. Twelve, Fifteen, Eighteen and Twenty Inches Long and Six Inches in Diameter. Prices Sent on Application.** Correspondence solicited. Address,

O. E. BROWN MANUFG. CO.

GRAND RAPIDS, MICHIGAN.

SCIENTIFIC AND MECHANICAL

COAL GAS AS A MOTIVE POWER.

BY J. F. T.

GAS engines are largely used in the great cities where illuminating gas is sold cheaply. They are both useful and economical for many small purposes where one to ten horse power is required, such as running sewing machine, printing presses, coffee and peanut roasters and grinders, malt mills in small breweries, the smaller grain elevators, and many similar uses. As they require no engineer, have no boiler, consume neither coal nor water, and when not in use cost nothing at all except for the interest of the money on the first cost, they are a very desirable and cheap motive power for light purposes. Strange to say, recent investigations as reported in Van Nortrand's Engineering Magazine, by Messrs. Brooks & Steward, of the Stevens' Institute, show that so far as utilizing all the power in the fuel goes, these engines have more than double the efficiency of steam engine, of the same class. It is very seldom that a small steam engine utilizes more than 4 to 6 per cent. of the actual coloric, or heat in the fuel, while the consumption of the heat in the gas engine is reported by the gentlemen above named, as follows:

Actual useful work and friction....	17	per cent.
Hot expelled gases (waste).....	15½	" "
Water jacket waste.....	52	" "
Radiation "	15½	" "
	100	

Here, it will be noted, more than half the entire heat, or 52 per cent. generated by the combustion of the gas, is wasted and carried off by the water jacket, thus showing very plainly the economic deficiency which yet exists in this style of motive power and the mode in which economic improvements may be made to increase their efficiency in doing work cheaply. The very best steam engines seldom utilize ten per cent. of the units of heat produced by the combustion of coal, and this only in the largest class of improved engines, the smaller ones showing a corresponding decrease. But from this it must not be understood that in all cases gas engines are more economical, efficient or desirable than steam. This is by no means true. On the contrary, the excessive profits made by the gas producing companies, and the large dilutions of the gas with common air before it reaches the consumer, render it in most instances the most expensive and costly, though ofter the most desirable.

As showing how largely the gas of commerce is adulterated with atmospheric air, in no case in which it was used, could the experimenter obtain an efficiency greater than 7 to 1, though the ratio claimed for pure gas is 10 to 1. This would show a dilution of about 33 per cent. which of itself is a profit that few users of steam power realize in their various enterprises. Where ordinarily gas can be bought for not more than $2.50 per 1,000 feet, measured by a meter that does not charge for much more gas than is actually consumed, for a light power not exceeding 10-horse power, gas is regarded as about equal to steam produced by a good quality of soft coal, not costing more than $3.50 to $4.00 a ton.

TRANSMITTING POWER BY ELECTRICITY.

The question of the expense of transmitting power by electricity has recently occupied the attention of Prof. Osborne Reynolds, who made it the subject of a Cantor lecture in England. His conclusions are: Thanks to the experiments of M. Deprez, we know that a current of electricity equivalent to 5 horse-power, may be sent along a telegraph wire ⅛ inch diameter, some ten miles long—there and back—with an expenditure of twenty-nine per cent. of the power. Messrs. Hems send 500 horse-power along a ¾ inch wire rope. To carry this amount, as in the experiment of Deprez, 100 telegraph wires would be required; these, wound into a rope, would make it 1.4 inches diameter, four times the weight of Messrs. Hem's rope. With the moving rope the loss per mile is only 1.4 per cent., while with electricity it was nearly 6 per cent. With the Hem's rope the loss at the ends in getting the power into and out of the rope amounted to 2.5 per cent.; in Deprez experiments 30 per cent. was lost in the electric machinery alone, which is very small machinery comparatively. This does not include loss of power in transmission to and from the electric machinery. Taking the whole result, it does not appear that more than 15 or 20 per cent. of the work done by the steam engine could have been applied to any mechanical operation at the other end of the line, as against 90 per cent, which might have been realized with the wire rope transmission.

* * We often hear complaints that the boiler inspection in the United States is far from perfect, but a speedy reform is absosolutely necessary in England if we are to judge their system of inspection by an article in the London *Engineer*, which says: A proposal for insurance is made to a given company. The inspector comes down, examines, and sends in an adverse report. The reply of the boiler owner is that he is sorry to find that the boiler cannot be insured by the company in question; that, however, he has no doubt it can be insured by another company, which he names. Then the first report is re-considered; certain patches are perhaps put on the boiler here and there, the safety valve load is reduced a pound or two, and the boiler is accepted for a year. Anything, in fact, is done rather than let the rival company in. It must not be forgotten that this system is entirely opposed to the wish of the engineers and inspectors of the companies. They have really no choice in the matter. Apparently free agents, they are virtually bound to do that which will please the directors and bring in business.

* * The last issue of the *Engineering and Mining Journal* contains the following: A subject that has been discussed in this country on many occasions in the technical and the daily press, at gatherings of engineers, before municipal committees, &c., is that concerning the best means of ascertaining as correctly as possible the work of boilers, and incidentally the steaming qualities of different kinds of fuel. It is a question which comes up almost daily in computing the duty of pumping engines; and yet no organized effort has been made, so far as we know, to lead to an agreement upon some standard system, which would furnish results more readily comparable. At times, results in tests of boilers and engines, glaringly inaccurate, have been challenged and their unreliability clearly proved; but there is reason to fear that from indolence many have been allowed to escape criticism.

* * Recent experiments show that spruce beams, loaded to one-half to two-thirds their breaking strain, finally break after a long and steady deflection, which continually increases until the final rupture occurs says the *Artisan*. If substantiated by further experiments, this fact will go far toward explaining the frequent falling of mill and warehouse floors, under loads supposed by the builders to be perfectly safe. The floors of all such buildings should be sufficiently strong to carry at least five times the weight that can, by any possibility, be put on them, and at least five times as strong as the ordinary load. Where there is running machinery in the building, which is likely to produce jar or tremble, these figures must be exceeded, as the effect of a continuous jar and strain combined is very destructive to the building in which they are found.

* * Professor De Volson Wood, in a communication to *Science*, in which he points out that there is the same difficulty in the fundamental conception of the method of limits as of the infinitessimal method in calculus, says in support of his position: "A student learns to repeat with ease, 'Velocity is rate of motion,' and thinks he understands it; but I have had many such ask, 'In a mathematically perfect engine, does the piston stop at the end of the stroke?' 'Does it remain at rest at any time?' 'How can it reverse its motion, if it does not stop?' 'How can it cease going in one direction, and move in the opposite direction, without stopping between the two motions?' These are critical questions, lying at the very foundation of all change of motion. Does change in the rate of motion take place *at* an instant, or *during* an instant?"

* * A representive of the *American Machinist* has been endeavoring, to the best of his ability, to get a sight at the triple thermic motor, which is at work somewhere in New York city. So far the *Machinist* man has got left, but he is reasonably happy, from the fact that he has received a promise to enjoy a thorough examination, to be made at some day in the future. Representatives of other mechanical and engineering papers, we are told, have been refused, point blank, to even see the new engine which has stirred up so much discussion.

* * The annual rainfall in this country, according to the weather signal, is lowest in New Mexico, 13 inches, and California, 18 inches; highest in Oregon, 49, and Alabama 56. The annual rainfall in the British islands among the mountains is 41 inches; on the plains, 25 inches; 45 inches of rain falls on the west side of England, and 27 on the east side.

* * Engineers of the New York Central Railroad are now forbidden to drink intoxicating beverages off as well as on duty. Most of the railroads are moving in this direction, the fact being recognized that drinking at any time unfits a man to run a locomotive.

* * Paper bottles are now made on a large scale in Germany and Austria.

The Milling World's Observatory.

Notes from the Mills.

The daily capacity of the mills of St. Louis is said to be 19,355 barrels.

Wheat in Cass county, Mich., does not present a very gratifying appearance.

The new elevator at the Pillsbury A mill in Minneapolis, has been put in use.

Capt. Shuler has retired from the mill furnishing firm of R. G. Shuler & Co., Minneapolis.

W. H. Barber & Co., Allentown, Pa., lately furnished Hugo Barty, of Keytesville, Mo., a 48 inch improved Eureka turbine.

W. H. Barber & Co., of Allentown, Pa., have furnished a 36 inch improved Eureka turbine to Wm. Graham, of Clearfield, Pa.

W. H. Barber & Co., of Allentown, Pa., have furnished a 12 inch improved Eureka turbine to Jacob Heiler, of Lehigh Gap, Pa.

Bowen Bros. are having a three-run steam mill outfit made for them by Nordyke & Marmon Co., which will be set up at Maysville, Ind.

James Veatch & Son are remodeling their mill at Redmond, Ill., with machinery from Nordyke & Marmon Co., of Indianapolis, Ind.

A three-run new process mill is being built at Dublin, Tex., using machinery made by Nordyke & Marmon Co., of Indianapolis, Ind.

On April 16, a fire broke out in the Sower flour mills, Princeton, Ill. The fire was confined in the mills, which were valued at $30,000.

The Schwegman Milling Company, of Washington, Mo., will shortly put in two new boilers. It also contemplates remodeling to the roller system.

Lessig & Co., of Ashland, Penn., are building an 80-barrel roller mill, and Nordyke & Marmon Co., of Indianapolis, are making all the necessary machinery.

Charles Tiedeman reports his new O'Fallon (Ill.) flour mill nearing completion. His boilers are in position and he is daily expecting the arrival of his 22x48 engine.

The old Parsons mills at Parsons, Kan., have burned. The mills cost $20,000, but have been idle for some time. The actual loss is $10,000; insurance $8,000.

Hanna, Mouldin & Co., are having built for them at Oakland, Ind., an 80-barrel roller mill using Nordyke & Marmon's machinery made at Indianapolis, Ind.

Basher, Hepner & Leedy, of Longmont, Col., have ordered a large amount of machinery of Nordyke & Marmon Co., of Indianapolis, Ind., for improving their mill.

McAnnally, Raney & Co., of Sipe Springs, Tex., are building a two-run custom mill and procured their machinery from Nordyke & Marmon Co., of Indianapolis, Ind.

W. W. Huntington and L. G. Cook, are to build an elevator and storage warehouse for coarse grains on First street, near the mouth of Bassett's creek, at Minneapolis.

The Case Mfg. Co., Columbus, O., have recently been awarded the contract by W. W. Briston, Girard, Ill., for a full outfit of breaks, rolls, purifiers, centrifugals, etc.

The flouring mill at Volga, Dakota, has started up, and is proving a complete success, turning out fifty barrels per day of first-class flour, and is constantly crowded with orders.

Robt. Christian is building a two-run water mill at New Canton, Tenn., using machinery made by Nordyke & Marmon Co., of Indianapolis, which is being set up by Mr. John R. Creasy.

J. L. Bihn, of Tiffin, O., is building a one-run custom mill driven by steam, and has selected his machinery from Nordyke & Marmon's mill building establishment at Indianapolis, Ind.

Oelze Bros., of Cloverport, Ky., are among the latest to adopt the roller system, their contract for a complete overhauling having been awarded to Nordyke & Marmon Co., Indianapolis, Ind.

The flouring mill of W. C. Hall, at Brazil, Ind., is being changed to the roller system, using rolls and other machinery made especially for him by Nordyke & Marmon Co., of Indianapolis, Ind.

A 75-barrel roller mill is being built near Gibbon, Neb., for J. N. Davis & Bro., old millers in that locality. Their entire contract is placed with Nordyke & Marmon Co., Indianapolis, Ind.

The mill of W. S. Hall, of Steele City, Neb., and W. H. Patterson, of Smithville, Mo., are under oing extensive repairs with machinery from Nordyke & Marmon's shops at Indianapolis, Ind.

According to the reports of the Washington Agricultural Department, there are 27,000,000 acres in the United States under winter wheat, which is an increase of 2,000,000 acres over last year.

Carter & Emmons, of Celino, Tenn., who met with the loss of a fine flouring mill last fall, have contracted with Nordyke & Marmon Co., of Indianapolis, Ind., for a 75-barrel roller mill outfit of improved style.

The Ute Indians, on the reservation near Ignacio, Col., are preparing to farm extensively this season. They already have wagons and plows, and they have learned to love the useful and beneficial articles so report says.

The Brownwood Mill Co., of Brownwood, Tex., have organized to build a 200-barrel steam roller mill, and the machinery for the entire outfit is being shipped from Nordyke & Marmon Co.'s mill works at Indianapolis, Ind.

McDowell & Basye, of Simpsonville, Ky., are replacing their burned mill with a first-class roller mill of 100 barrels capacity, and their rolls and other machinery are being made by Nordyke & Marmon Co., of Indianapolis, Ind.

W. H. Barber & Co., of Allentown, Pa., have lately furnished for Joel Schierers extensive ore mines at West End, N. J., a complete outfit of the most approved hoisting machinery with a 10x24 engine and a 42x8 ft. locomotive boiler.

L. H. Sparks & Son, of Indian Head, Pa., having recently purchased one of the Improved Barber Segment Bark mills built by W. H. Barber & Co., of Allentown, Pa., say they have lost the price of the mill by not buying it a year sooner.

The mills of Haworth, Smock & Co., Dill & Son, and Evans & Sohl, all of Noblesville, Ind., are being remodeled to the system of gradual reduction and the machinery comes from Nordyke & Marmon Co.'s works, at Indianapolis, Ind.

The improved Eureka turbine, manufactured by W. H. Barber & Co., of Allentown, Pa., is meeting with great favor in the southern states. Jacob J. Miller, of Buck Snort, Fayette county, Ala., has recently purchased from them a 30 inch wheel.

John H. Sick, of Lebanon, Pa., has recently made extensive changes in his milling property at Union Forge, Pa., and has put in three 40 inch improved Eureka turbines manufactured expressly for him by W. H. Barber & Co., of Allentown, Pa.

F. F. Sear, of Lawbertville, N. J., has lately furnished his mill with an extensive outfit of milling machinery constructed for him by W. H. Barber & Co., of Allentown, Pa., under the direction of the widely known milling engineer, J. W. Slocum.

Curry & Glover are building a 75-barrel roller mill at Aurora, Neb., and Nordyke & Marmon Co., of Indianapolis, are furnishing their machinery. Fr. Hagenmeister, of the same town, has also ordered a three-run mill of the same firm.

The firm of Davis & Taylor, the leading flour and grain house at Boston, Mass., has been forced to the wall by the death of the junior partner last Tuesday. The liabilities are estimated all the way from $300,000 to $1,000,000, and the assets at $250,000.

The prominent mill-builders, Nordyke & Marmon Co., of Indianapolis, Ind., have just completd a 100-barrel mill, at St. Paul, Neb., for H. C. Metcalf, and have commenced upon a similar mill on the roller system for Crow & Leftwich of the same town.

The foundation walls are in for the new elevator adjoining Elevator A, and to be built by the Minneapolis Elevator company, Minneapolis. A great part of the lumber is on the ground, and the superstructure will be pushed so as to have the elevator ready to receive the fall crop.

Ground was broken on the 14th inst. at Niagara Falls, for the long-talked of 1,200 barrel mill. The mill proper will be six stories high, and cover a ground space of 60x128 feet. The store-house will be two stories high, and 56x128 feet on the ground, while the elevator will be 50x120 feet on the ground.

Otisville, Mich., is to have a new elevator and flouring mill. Some of the leading citizens of the town have organized a company with plenty of paid-up capital to erect the buildings, and, as soon as a suitable site is decided on, the contracts for the machinery will be let. The intention of the company is to erect a mill second to none in the state.

The boys down at Easton, Pa., have been smoking "good" segars at the expense of Mr. J. T. Walter, on account of a "boy," which Mr. Walter anticipates will cause the wealth which he is accummulating from the sales of his well known purifier to flow in a double current, and with an alarming velocity from his pocket book.

Crop reports from all sections of the country give substantial promise of a good year. Since the season opened so early, nothing but a long continuance of weather of unusual severity can prevent Minnesota and Dakota from getting their seed in the ground in excellent time, which is always favorable to the success of the crop.

The Atlantic Flour mill, St. Louis, recently built, and considered one of the best in the country, was sold last week for the benefit of the creditors. The price realized was only some $25,000, but with the encumbrances assumed amounts to about $125,000. It was bid in by the bondholders, and will, no doubt, resume operations at an early day.

Robertson & Parmalee, of Shamoken, Pa., will reconstruct their mill, having arranged with the Stilwell & Bierce Mfg. Co., Dayton, Ohio, for twelve pairs of Odell roller mills, Geo. T. Smith purifier, flour packer, Silver Creek bran duster, Silver Creek centrifugal. Messrs. Kreider, Campbell & Co., of Philadelphia, are doing the work.

The new American iron clipper ship, Tillie E. Starbuck, sailed from Portland, Oregon, on April 13, for Liverpool, with a cargo of wheat and flour. The total value of the cargo is $117,000, being the most valuable cargo of grain that ever left the mouth of the Columbia river. This vessel is the first full-rigged iron ship ever built in the United States.

Considerable solicitude for the growing wheat is felt by farmers in the vicinity of Wabash, Ind. The unseasonable weather of last week has materially affected the previously very favorable outlook, and many fields in Wabash county it is predicted will not yield five bushels per acre. Farmers in various portions of the county are discouraged.

G. W. Fenton & Co., of Frewsburg, N. Y., have about completed the renovation and enlargement of their lumbering mills. After a careful investigation of the merits of the numerous turbines now in market they selected the improved Eureka, and purchased a 27 inch of W. H. Barber & Co., of Allentown, Pa. The same house also furnished them a complete outfit of shafting, pulleys, gearing and hangers.

The firm of J. M. Kendall & Co., of Bowdoinham, Me., will build a grist mill this spring separate from their fertilizer factory. Power will be supplied by a shaft from their present water wheel. This wheel is different from any other in the country, having been designed for the locality by Mr. Kendall. On account of the strong tide in the river, the wheel sets across the river and furnishes steady power whether the tide ebbs or flows.

The *Indiana Farmer*, has crops reports from every county in Indiana, Illinois and Ohio, which shows the following per cent of wheat: Average compared with the average crop in Indiana 95, Illinois 80, Ohio 97. Condition of wheat in Indiana 89, Illinois 69, Ohio 84. Clover promises an average yield of 80 per cent, but peaches not more than 10 per cent. With the exception of peaches this is much better showing than that given by the *Farmer* for the same date last year.

Three of the best and fastest steamers left New York, we were told last week, one carrying grain at 1½ pence, another, at 3 pence 3 farthings, while the third went in ballast, unable to obtain anything worth carrying. Such a scarcity of paying freight is a sure index of the condition of the demand for our cereals at the other side, and thus the suicidal policy of the crazy bulls in Chicago not only injures our own markets and people, but ruins the shipping trade and prevents any further improvements in ocean navigation.

Edwin F. Smith, secretary of the California state agricultural bureau, says the reports from his correspondents show that unless some disaster overtakes it, the Pacific coast will have an unprecedented wheat yield that will exceed the crop of 1880 if it escapes the hot north winds of May and June, which usually come about the time grain is in dough. The Sacramento and San Joaquin valleys will profit greatly by the bountiful rains which fell in March. The yield in these valleys may safely be placed at 60 per cent. in excess of last year's crop if the effect of the hot hot winds be passed.

The boiler in the grist mill of Daniel Bathrick, at Davison station, eight miles east of Flint, Mich., burst with terrible effect. The engine house and mill were completely wrecked, and portions of the boiler and building were thrown a distance of twenty rods. John Miller, the engineer, was buried beneath the ruins, and was rescued in a dying condition. He is about 26 years of age, and is married. Three other persons who were near the building when the explosion occurred, were injured but not dangerously. The loss occasioned by the disaster is estimated at about $3,000. The explosion was caused by low water in the boiler.

Allen Township, Iowa, we hear had a terrible Mill explosion down on Middle River. The accident occured last week, and seems to have resulted as much on account of a very old and inferior boiler as any thing else. The mill was owned by Mr. Henry Spencer, who also had an interest in another mill. Himself and a younger brother David Spencer, and a nephew, a boy by the name of Cleghorn, twelve or fourteen years of age were running the mill. From some cause the boiler exploded with terrible force, and one piece of it was said to be found nearly one-eighth of a mile from the mill. Mr. Henry Spencer was almost instantly killed. He only spoke a few words after he was found. David Spencer and the boy were both very seriously and probably fatally injured.

Apart from the prices, the dishonesty of some of the New York merchants seems to have a great deal to do with the absence of demand for our wheat, says the Chicago *Daily Times*. Complaints are heard on all sides of wheat being constantly adulterated in New York. It appears that Baltimore and Philadelphia standard is considered always worth two or three cents a bushel more than New York. Europe takes from us only No. 2 red winter wheat. The standard of this wheat is quite satisfactory in St. Louis and Chicago, but it seems that Toledo, Buffalo, and New York are in the habit of mixing the good wheat received from the West with all sorts of trash. Rye, barley, cockle, chess, and a lot of things that a layman has never heard of are mixed up with it. As a matter of course, nobody wants such stuff, and the speculative shipments have to be sold for what they fetch.

Depression in the wheat market will militate somewhat against increased acreage in Minnesota, but this will be offset by the difficulty in obtaining seed corn in Southern Minnesota and Dakota. In some of the southern counties good seed corn, acclimated and of the sort farmers are willing to take chances on, is quoted at $4.50 per bushel, and hard to get at that. Last year's corn crop was a failure, and none of the corn matured sufficiently to be available for seed. Barley and oats will be sowed largely, as cattle and hogs must be fed, and much land will be seeded down in grass. All things considered, Southern Minnesota wheat acreage will be about the same as last year. The acreage throughout Dakota, through settlement and increased breaking, will be increased about 15 per cent, and in Northern Minnesota and the Red river valley the increase will be 10 per cent.

Of Sir William Howland's mill at Watertown, Ont., the following local notice may be of interest: The five or six acres on the east side of the stream are literally covered with the necessary buildings to carry on the immense business done there. About fifty years ago the first grist and saw mills were erected on this site, which formed the nucleus, and gave the name of Waterdown to the village. Having passed through various ownerships, the present proprietors, Sir W. H. Howland & Co., came into possession about 1885. In 1860 the mill was consumed by fire. The main part of the mill was then re-built, being 60x40 feet, four stories high, of cut stone, with stave factory attached. The large cut stone warehouse on the side hill above the mill, is well and handily constructed, the grain from it being conveyed to the mill as needed. The residences of the millers and other workmen are clustered round on the hill sides in close proximity, and taken in with the cooper shops, warerooms and barns, stables, stave and other sheds, form one of the most delightful pictures of thrift and industry that can be seen in the province. The farm property of thirty acres on the top of the hill, on which is a beautiful mansion of cut stone, immediately overlooking the works before described, known as Paradise Hill, is one of the finest residences for which the village is becoming noted. The grounds are beautifully laid out and decorated as well as covered with the choicest of fruit trees. For many years the business has been over $100,000 per year, and has been conducted successfully for the last twenty-five years by the late Wm. Robson, to whose sterling business ability and upright dealing must be attributed to a great extent, the succees of the establishment, as his word, weight, and dealing were never questioned by a single farmer in the locality. Since his death, his third son, M. Robson, has had entire charge of the works. Power is supplied by water and steam—a double upright engine, 50-horse power. The machinery in use, and which has lately been put in, is of the latest approved kind, being the James Jones gradual reduction system. In fact, all the appliances are of the very best known. Since the introduction of these improvements, the fame of these mills is quickly spreading for the excellence of the brands produced. The mills are now busy manufacturing flour from Manitoba wheat. The head miller is lately out from England. The second miller is A. L. Robson, and about twenty hands are employed.

FROM Foreign Lands

CHILLED IRON ROLLERS.

From *Muehlen & Maschinen Industrie Zeitung.*

CHILLED iron is a form of cast iron with a surface as hard as flint. When molten iron is poured into moulds which are made of good heat-conducting material, such as iron, steel, etc., then the surface of the cast which comes into direct contact with the mould, forms an exceedingly hard layer. This is due to the fact that on account of the rapid cooling, the carbon does not separate as graphite, but remains chemically incorporated with the surface of the cast. Such products we know as chilled iron.

The rollers for mills are cast in drilled cast iron cylinders, and are therefore chilled on their entire surface, which hardness decreases towards their center, and as a consequence, they can be hollowed with ease. Theoretically the manufacture of chilled iron appears exceedingly simple, practically it presents many difficulties, depending largely upon the chemical composition and proportion of the iron, of the temperature and thickness of the walls of the mould, and many other conditions.

The exceedingly small amount of wear of the surfaces of the best chilled rollers, recommends their use very strongly for milling purposes as compared with stones. In smooth rollers this wear is almost nothing, and even in grooved rollers it requires many months, even years, before any sharpening is necessary.

NOTES.

The Russian government is tinkering its tariff laws, which are considered too low. The special aim is with regard to coal and iron.

Late postal advices from Germany report the weather very rough and cold, but the agricultural reports remain of the same favorable character.

The crops in Northern Africa are looking very well on account of the abundant rainfall of the last month, and a good harvest is being looked forward to.

Favorable weather in every respect has still been enjoyed in France, and the cereal crops are considered to be several weeks more forward than in ordinary seasons.

In view of the success of the electric lighting of railroad cars in Austria, the Austrian minister of commerce has recommended its adoption by all railroad lines of the empire.

Almost two million acres of land are irrigated in East India. The irrigation canals are built by private companies, and pay an annual dividend of from four to seven per cent.

The Albert Bridge Flour Mills, at Battersea, a complete new roller mill, built for two well-known country millers by Thompson and Williamson, of Wakefield, on their particular system, has just been started.

In the north of Russia the weather continues frosty. In western Europe the weather was mild and the crops well spoken of. In all the more important European markets the grain trade was dull, with values weaker or declining.

Reports to the *Mark Lane Express* (London) from Valparaiso state that the new crop of Chilian wheat was beginning to come forward at the middle of January, but the sellers' ideas of values were above the equivalent in the English market.

Some authorities, not to be despised, recommend the heating and not the dampening of brittle Indian wheats, as leading to better after results. It is somewhat strange that no wheat heaters are advertised in England, although in America, says the *Millers' Gazette*, where perhaps they are less required, there are several specialties in this line.

The distilleries produced during the past year 89,593,000 gallons of pure alcohol. There has been an increase in the number of distilleries over that of previous years in the northern and central, as well as in the Baltic provinces, the manufacture of eau-de-vie from potatoes, compared with the period of 1881-82, having risen to 128,023,760 pounds of the raw material.

Every arrangement possible is being made to insure in the forthcoming millers' convention at Stockton-on-Tees, England, a thorough success. A local secretary has been appointed, visits to leading objects of interest in the neighborhood are being organized, treaties are being made with railway companies to give facilities for those visits, and seven papers will be read on subjects of the utmost interest to millers, by experts of the first rank.

In Russia a complete staff of inspectors has been appointed to enforce the following stipulations of the new law regarding children in mills. 1. Children under ten years of age must not be allowed to work in factories. 2. Workers from the age of twelve to fifteen years must not work more than eight hours a day. Night work for children can only be authorized in establishments where the process of manufacture can not have a bad influence on the health. Even if allowed the work must not exceed four hours. 3. The work of children must be regulated in such a manner as not to prevent their going to school three hours every day. 4. The owners of factories are all obliged to admit inspectors and their assistants into their works at any hour of the day.

The question is asked, "Are we about to see another revolution in the art of milling?" If so it is of very serious import to the millers of this country, says the *Millers' Gazette*; not only to those among them who have lately made either a complete or partial re-arrangement of their mills, but also to those who have not yet made any alteration, and to those who contemplate doing so. Our reason for alluding to this question just now is the news that reaches us from Buda Pesth to the effect that one of the largest mills there, whose brand is a well known and highly appreciated one on this market, is to be refitted throughout on an entirely new system. It is certainly somewhat startling to find that such an important mill, fitted up with all the most modern appliances for the production of the finest flour in the world, and, moreover, which declared a dividend in 1883 that would have gladdened the heart of many a miller in this country, should nevertheless find it to their advantage to make a clean sweep of their existing plant and decide on adopting an entirely new system. We are not in a position at present to give the details, but we know that before taking such a drastic step the directors went to the very great expense of building a small mill, fitting it with the new system, and working it for the greater part of last year.

The summary of the report on the International Exhibition at Paris in 1878, published by the jury, regarding the class relating to milling, is worth translating, says the *Millers' Gazette*. It says: "The new systems of milling by means of rolls, and the various concomitant systems of cleaning, classifying, and regrinding middlings, merit the serious attention of French millers; not that we fear that rolls will ever dethrone the judicious employment of good stones in milling, stones well made and well put up, but in the manufacture of extra flour it is certain that some countries, notably Austria-Hungary, have arrived at a high degree of perfection. The use of these flours would in France, as elsewhere, be confined to a not very numerous class, residing in large centres, and such flour could not be sold at an equally low price as the first quality flour obtained in French milling. French millers cannot all adopt this system, but it seems to us that they might realize their aim by a more simple and expedient system derived from the Hungarian system. We should think the best manner of proceeding to be this: The cleaned wheat should be first broken by a special machine, which should split the wheat longitudinally; then rolls or other appliances should be used to make as much as possible of middlings, and as little as possible of flour, the latter of course being of mediocre quality. The middlings should be then purified and classified by special machinery adapted for that purpose; the large and ordinary middlings should be reduced on rolls, and the fine white middlings on stones, which would do this work more economically in every respect than rolls, which exert too great a pressure and consume too much power, developing more heat than stones."

DISCLOSURES OF THE CANADIAN CENSUS.

The second volume of the "Canadian Census for 1881," just published, though devoted exclusively to vital statisties, furnishes data for some interesting comparisons of the material progress of the Dominion during the past decade. As regards population, the growth of our neighbor appears quite respectable in the light of percentages of increase, although the numerical additions are not imposing. The increase in the total population in ten years was less than a million, but the percentage was not far behind that of the United States, being 24 per cent, against 30 in the latter. In the two Provinces of Ontario and Quebec, which together contained 3,282,255 out of the 4,324,610 for the whole country, the ratio of increase was considerably smaller, being 18 per cent for the former and 13 per cent for the latter. In fact, one-third of the total increase is due to the enumeration of the population of provinces not included in the previous census, as Prince Edward Island, Manitoba, British Columbia and the Territories; though it is likely that these contained but few inhabitants at that time. Immigration, due to the attraction of Manitoba particularly, was more conspicuous than ever before; and it was in the agricultural classes that the principal growth in the Canadian population has taken place. About one fourth of the people are registered as being employed in some occupation, and their classification for the two last censuses are as follows:

	1871.	1881.	Per Ct.
Agriculture . . .	479,512	662,630	
Industrial . . .	212,803	287,296	
Commercial . .	75,201	10-	
Domestic . . .	60,104		
Professional . .	39,144		
Not classified . .	143,07-		
Total . .	1,0-		

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There are many points of comparison in the numerous details of classification, industrial and social, that are of much interest to the specialist, but which would lead us too far from our purpose to consider here. What has already been pointed out will suffice to show that substantial progress was undoubtedly reached in the course of a decade heavily weighted, not only with a protracted commercial depression, but by the adoption of an economic policy which is calculated to restrict rather than to expand the many important industries.—*Ex.*

THE Grain and Flour Trade

Office of THE MILLING WORLD.
Buffalo, N. Y., April 23, 1884.

The impression is gaining that our stocks of wheat will soon be called upon to make up anticipated English deficiencies. If what *The Miller*, London, intimates viz: that stocks in London and elsewhere are diminished and no heavy supplies coming forward, be true, then quite reasonably we may anticipate something more in the way of an export demand than the past two months have witnessed, but if the representations of the secretary to the London Corn Exchange may be credited viz: that the water-side stocks at London are enormous, then this possibility of an active export demand becomes less alluring. Since our last issue prices for wheat have fluctuated yet at this writing evidence some degree of firmness. To just what this is attributable it would be difficult to determine. The N. Y. *Commercial Bulletin* says: A further advance has been secured on wheat and corn, the explanation of which is found in the better temper of the foreign advices, which indicate more active and higher markets abroad. Added to this is the confusion of ideas as to the actual condition of the winter wheat crop and the extent of the spring wheat planting. The want of definite or uniform information on this point is making the shorts uneasy. Reports have been circulated to the effect that the average condition of the growing wheat shows a falling off of three to four per cent. since last week; and these had their influence even with parties who not believing them dared not act on the assumption that they were not correct. Ideas are very much mixed at the close of business, and a good many traders are prepared for a reaction. There has been a good deal of "evening up." The bulls have been realizing and the bears have been covering to an extent that leaves most of the local trades with clean scores. Business in a speculative way has been active. Business in cash grain has been moderate. The options at the opening showed a decline of ⅛@¼c. The opening prices were the lowest prices. The highest prices showed an advance of 1c.

Corn advanced in Chicago about 3c. The special strength of the Chicago market was the covering of a large line of shorts, with comparatively little stuff for sale. There has been no special activity in corn in this market. The advance here has been a sympathetic following after the Chicago market, and in keeping with the bullish feeling in grain generally. Light receipts have been one element of strength; the strong cables another. Reports from Chicago favor the idea that the sharp advance will result in bringing out more corn from the country, and suggest caution on the bull side at present prices. The market closes easier for corn in both markets, but the pulse is feverish and excited. Some of the bolder bears in corn are selling in anticipation of a general break in grain.

There has been very little speculation in oats. The market advanced ½@⅝c. with corn; subsequently dropped back, apparently of its own weight, and closed in a featureless condition. It takes very little selling to put the market down, as there is hardly any buying nerve. Cash oats have been ¼@⅜c. higher, but close with the improvement partially lost, after a fair business. Rye is steady. Barley is firm. Seeds show no change; a fair business in grass seeds at full prices; no large lots saleable.

The flour market is stronger, and in some instances prices are higher. This is the first time for months that a statement of this kind could be made. There is more looking about for flours. ...provement is general. The city mills are ... upward direction. From the low- ...ls have advanced 25 cents; of ...s made within the ... been very ... are depends upon the future course of wheat that we stop at the self-evident fact that the market is firm. Fine grades of rye flour are also firm; low grades are dull; no change in prices for rye flour; demand generally moderate. Corn goods are firmly held, demand fair. Bag meal is firmer and moderately active. Mill feed is steady with a fair demand.

FOREIGN EXCHANGE.

The market for sterling was quiet and unchanged. Up to the close of business, the specific engagements for Wednesday's steamer were $1,850,000, and additional sums were reported later. The posted rates are 4.88@4.88½ for 60 days' and 4.90@4.90½ for demand. The actual rates were: At 60 days' sight, 4.87½@4.87¾; demand, 4.89½@4.89¾; cables, 4.89¾@4.90; commercial, 4.86¼@4.86½. Continental exchange quiet and steady, rates nominal; francs, 5.17½@5.16⅞ and 5.14⅜@5.13¾; reichsmarks, 95¼@95⅛ and 95¾@95⅞; guilders, 40⅛ and 40⅝. The closing posted rates were:

	60 days.	30 days.
London	4 88½	4 90½
Paris francs	5 15⅝	5 13⅛
Geneva	5 15	5 12½
Berlin, rejchsmarks	95½	96⅛
Amsterdam, guilders	40⅜	40⅝

BUFFALO MARKETS.

FLOUR—City ground clear Duluth spring $5.50@6.00; straight Duluth spring, $6.00@6.25; amber, $5.7 @6.00; white winter, $5.75@6.00; new process, $6.75 7.00; Graham flour, $5.50@5.75. Western straight M nesota bakers, $6.25@6.75; clear do, $5.50@6.00; w winter, $6.00@6.25; new process, $7.00@7.50; low g flour, $3.50@400. CORNMEAL—Market steady, a fair demand. Coarse, $1.15; fine, $1.20 per RYE FLOUR—In fair demand at $3.75@4.25. MEAL — Ingersoll, $5.75; Bannerman's gran $6.00; Schumacher's Akron, $6.25 per bbl. WHEAT FLOUR—Holders of both No. 1 h red winter wheat asking higher prices. Sale loads of the latter at $1.06; at the Call Boar $1.07½ and milling white at $1.06½. No. 1 b ern Pacific held at $1.12. CORN—Active Sales three car-loads No. 2 at 56c; twenty 58½@58¾c; eleven do new mixed at 54½ three do certificate high mixed at 59c. OATS Western at 38@38½c; No. 2 white 41c; sample w 39@40c; State from wagons, 43@44c. BARLEY Scarce. No. 1 Canadian 93@95c; No. 2 do 89@90c; No. 3 do 73@75c. RYE—No. 2 Western, 68@68½c.

OUR BIG FARMS.

Bonanza farming, says "Casual Listener," in the *Pioneer Press*, has ceased to be either a pastime or an advertisement. We hear very little about the huge Dalrymple or Grandin farms nowa-days, and the future will know still less about them. There was a great attraction to newspaper paragraphers five years ago in the stories of hundreds of teams plowing abreast, and of furrows several miles long. Many a good magazine article was written about the big farms, and for a matter of some $50,000 invested by the real parties in interest the advertisement sold millions of acres of land for the railroads. Buyers were not deceived in the value of these lands. They generally sold again and doubled their money. Those who farmed their purchases have done well. But the big farms were too much of a good thing. Mr. Grandin's lieutenant, Mr. Hague, is coming to St. Paul, and Grandin prefers to sell his land and invest in Fargo business blocks. The Dalrymple farm will, sooner or later, break up into small farms.

The only thing that can possibly hold the big farms together is a successful use of steam for traction purposes. The waste of many teams of horses, big barns, numerous farm stations, and the uselessness of the whole outfit of tools and live stock during a large share of the year, explain why bonanza farming does not pay. The needs of a family on the small farm give excuse for diversifying crops and making the corners and edges count. I believe an old miller told me the secret of successful bonanza farming the other day. He said: "I am too old and lazy to experiment with my own ideas; but if I were going to farm Red river land, which I know, by all the evidence any sane man wants, is the best to be had in this country, I should farm a good deal as I hunt. I wouldn't build a barn, or drive a nail. All that is necessary is to put up good stout tents for men and horses. Have everything in good shape, so as to provide cool, dry, healthy quarters, and put the kitchen ...self. Buy foot-sore horses of the Chicago ...es, or if you can, from the Minnesota ... again in the fall when plow- ...omething on them, it is ...her all winter. ...for high ... the millers and sell directly from the field. As soon as stock and crops were sold, I should go to Florida or the Gardens of Gull."

A WALL STREET STORY.

A day or two ago, while in the office of a German broker at Exchange Place, I heard a group of men discussing Mrs. Ottendorfer's will, and naturally the conversation drifted to her son-in-law, Charles Woerishoffer, whose office was next door. Thereupon one told an anec... about him which is worth telling, as il... the fluctuations of fortune in fickle W...

Many years ago, Mr. Woerisho... and unknown clerk in the stre... his was comparatively well ... a prominent leather hous... day when Woerishoff ... he borrowed $150 ... giving his due bi... the clerk becam... since has gr... never paid ... to. He h... but no ... his o... men... fi...

...the ...inent ...is note ...her relic. ...aswered: ... dese days I ...n hundred and ...o get it." ...r, but the leather ...er & Co.'s biggest

ETTING-OUT.

...d just returned from Wash- ...s asked how he liked the ... every bunch of willows is a ... frog pond a sylvan lake, ... Minneapolis, every ridge ... very town a country seat, *S. Fran. ...lta.*

MR. MULHALL, the leading English statistian, contends that the daily increase of wealth in the United States is upward of $2,500,000, or about $838,000,000 per annum, which is one-third as much as the entire increase in wealth of the whole of the rest of the world. England, whose increas in wealth is next to our own, makes only a profit on all her business of $300,000,000 a year, or but little more than a third of our own.